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THE JOURNAL OF SCHOOL HEALTH

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HEALTH EDUCATION STATUS OF HIGH SCHOOL PUPILS AND NEED FOR COORDINATED SCHOOL HEALTH PROGRAMS*

JEAN V. LATIMER, A.M.

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The war is focusing more attention on the health of youth. More and more the high school is being looked at as an organized agency of the community which has possibilities for both the protection and the promotion of the health of the youth of our nation.

This past year, with funds from the Children's Bureau, the Division of Child Hygiene of the Massachusetts Department of Public Health has made a study of health education in the senior high school. The purpose of the study has been to survey the health activities now in operation, to discover the factors which are directly related to the present physical status of youth, and to use such information for the building of a more effective health program for high schools.

Participating agencies have been the Massachusetts Association of School Superintendents, the Massachusetts Association of High School Principals, the Massachusetts Medical Society, the Massachusetts Dental Society, and the Massachusetts Branch of the American Academy of Pediatrics.

A Joint Committee on Health Education, representing Massachusetts Departments of Education and of Public Health, with a professional advisory committee under the chairmanship of Dr. C. E. Turner, has directed this study. Warren H. Southworth, has been the research consultant for the Division of Child Hygiene, especially assigned to this work.

The following are the three parts of the study:

Part I. A survey of the existing health education programs.

*Read at the annual meeting of the American School Health Association, St. Louis, Mo., October 30, 1942.

Part II. A study of the physical health status of high school pupils.

Part III. An intensive study of the health practices, interests, knowledge, and attitudes of high school pupils.

It is to the all-inclusive survey of the present program in the 260 high schools of the commonwealth that I shall largely confine this paper. A principal's outline for study of the school health program was sent to each Superintendent and each high school principal. This study, made up of 13 pages, dealt with every aspect of the school health program, including medical and nursing services, healthful school living, and health instruction.

This in itself has already encouraged the beginning of coordination of effort in that the school principal, in order to supply needed information, has had to call into conference the school doctor, the school nurse, the school dentist, the director of physical education, the director of home economics, the teacher of science, the lunchroom manager, and other school personnel. One school principal said, "This analysis has demonstrated to me the necessity for a planned, coordinated, and supervised health education program in our high school — otherwise we will not be getting the best returns for the effort which we are putting forth."

While it is impossible in this brief paper to present all the findings, the following are among the most significant.

Health Examinations,—A large majority (over 70%) of all schools report that the health services are financed and administered by the school department. In some high schools (11%) the health services are a joint activity of both the school department and the health department. The health services in a few schools (9%) are financed and operated by the health department. A very low percentage of schools (½%) report that they have no health services, but this situation is probably temporary.

Of the high schools in Massachusetts, 75% give each pupil an annual health examination. 14% give each pupil one or two health examinations during his high school career.

The average time per pupil, the allotted health examination, exclusive of eyes and ears, is 6 minutes for all the high schools. However, the range of minutes per pupil reported for each examination varies from one-half minute to 15 minutes.

Forty-two per cent of the schools report that they require pupils re-entering school after three or more days absence for illness to report to the medical or nursing services.

A comprehensive list of questions was asked as to methods of follow-up. How effective the present system of high school health protection is will be further evaluated in another paper to follow.

How does the physician in the high school spend his time? Sixty-one per cent of the high schools report that the school physician visits the school only when called. A few schools (13%) report that he visits the school once a day, and fewer still (9%) report that he visits the school once a week. Possibly the same budget and personnel could be used more effectively in some way other than routine visits to the school. The health education value of such visits is not evident.

A dozen of the large high schools have full time nurses. The average time that the school nurse spends in 64% of the high schools in Massachusetts is approximately 6 hours per week. For cities and towns under 25,000 population, the average time that the nurse spends in the high school is only three hours per week.

Supervision,—In regard to the supervision of the entire health education program in the schools, only a few large communities have a full or part time trained health education supervisor. Some schools answer that the program is supervised by one of the following: the superintendent, the principal, the physical education instructor—with 17% reporting that the supervision is under the school nurse. One per cent of the schools report that the health education program is under the supervision of the school physician.

A detailed study of pupil awareness of physical defects will be discussed by the other speakers at this session. Over 90% of the high schools report that they send notices of defects to parents, but less than one-half of the notices sent to the home bear the signature of the school physician. Over three-fourths of the schools report that the school nurse is in charge of follow-up activities. In view of the amount of time which she devotes to the high schools, there is an obvious limit to the time she can devote to follow-up activities for the correction of physical defects.

Almost one-fifth of the high schools report that they do not urge pupils to have an annual dental examination by the family dentist—the method advised by the Massachusetts Department of Public Health. Whereas 79% of high schools report that they urge an annual dental examination by the family dentist, 75% of the schools do not keep a record of pupils who do have such an examination. Without records of dental examinations, the school lacks information for adequate follow-up procedures. Urging pupils to have an annual dental examination by family dentist

without keeping records of those who go to the family dentist is not an effective health education technique.

50% of the schools are still using the school physician to examine the teeth of high school pupils—a method not advocated by the Massachusetts Department of Public Health.

Almost one-fifth of the high schools in the State have no dental service. The reports from the schools in large communities (population 25,000 or over) give an indication of better supervision of the dental service than the reports from smaller schools, because the dental service in many of the small communities consists of only one dentist or a travelling dentist. In some school systems there may be a group of dentists rendering service to a single school, and in such cases there should be supervision. Only 8% of the large schools report a dental service which is under the direct supervision of a dentist. Here is a need for more coordination. Twenty-seven per cent of high schools say that there are no free dental services or clinics available to their pupils.

About 20% of the high schools have no school cafeterias. Most of these are schools in small communities (towns under 5,000 population). Sixty-six per cent of schools report self-supporting cafeterias and 8% have cafeterias which are not self-supporting. About 70% of the schools with a cafeteria have some plan to provide for pupils who cannot afford to purchase a lunch.

Thirty-nine per cent of schools sell candy during the lunch period, 21% sell candy only after the lunch period, and 6% have an occasional candy sale. In 17% of schools, most of which have cafeterias, there is no sale of candy in the school, indicating that it is not necessary to support a cafeteria on profits from sale of candy

One-half of the schools with cafeterias have *no* plan to check the quality of lunches selected by pupils. Here is an opportunity for health education which is not receiving the attention which it deserves.

A large number of schools with cafeterias have had a survey of the school lunch by either the Child Hygiene Division of the Massachusetts Department of Public Health (26% of schools) or the "Surplus Marketing Administration" (21% of schools). These figures represent 60% of all schools with cafeterias, and indicate the interest of school administrators in learning how to improve the school lunch.

The survey found that there are two general plans for health instruction in high schools, namely: (1) direct instruction through

a separate and distinct course on health and (2) integrated instruction, with health taught as a part of several other classroom subjects. A little less than half of the schools in Massachusetts report that they offer no health instruction either as a direct subject or as part of several related subjects.

The per cent of schools which have a faculty committee in charge of integration (6%) is significantly close to the per cent of schools which submitted a full schedule of integration (13%), and gives further evidence that of all the schools which reported an integrated course of health instruction (46%), only a few have a real plan for integrating the health topics.

Thirty per cent of all schools reporting, use health text books. The number of schools which report current health material in the school library is the same number as those who offer health instruction.

Use of films,—Films, posters, and exhibits are used extensively by the high schools. These are used, in clinics, lunchroom, locker room, library, and offices, as well as in classes. Films are used by 78% of the reporting schools, and the assembly hall is the place where most films are shown. Eighty-two per cent of schools report use of health posters which are displayed most frequently on bulletin boards. Health exhibits appear in fewer schools (47%) than either films or posters do, but when health exhibits are used, they are usually placed in the corridors or in the health classroom. Not more than 29% of the schools use any or all of these visual aids as an integral part of the health classes, which is, no doubt, their most valuable use.

Part II—A Study of the Physical Health Status of High School Pupils, which will be presented in some detail by the speakers to follow, also shows that there is little objective basis to the present system of the school health examinations and that a large per cent of the physical defects found never get corrected. Part II also seems to show that there is little health education value in the present plan of health examinations. With the growing organization of local public health programs one wonders whether or not better results could be achieved with the school medical service administered as an integral part of the total community Child Hygiene program rather than as a separate school function.

Before closing, one significant finding included in Part III* of this Study (to be reported later) should also be emphasized—an analysis of the pupil's health interest has shown that there are

*The presentation of Dr. Southworth which appeared in the Dec. Journal.

many personal health problems of youth concerning which he needs medical advice. There is little evidence that the high school in its present health education program is meeting such a need.

Summary of Outstanding Needs Revealed by This Study

1. From the evidence of this study the Massachusetts Joint Committee on Health Education recommends an extension and coordination of the high school health program so that each part will contribute to the effectiveness of the whole health program of the school and the community. Three general phases of this problem are: (a) the broadening of the high school health program; (b) the development of a closer relationship between the high school health program and the total school health program; and (c) the coordination of the school health program with the health and social services of the community.
   a. There is need for a high school faculty health council to assist in planning for health instruction, the educational aspects of the medical, nursing and dental services, and healthful school living.
   b. There is need for coordination of all levels of the school health program by professionally trained supervisors. A complete school health education program extends through all grades of the elementary, junior high and senior high schools.
   c. There is need for planning the school health program as a part of the community health program. The school has an obligation to assist the community health program because it is a great social and educational agency which can profoundly influence the community, and its facilities, records and resources are of tremendous value in promoting community health. Conversely, the school must of necessity draw upon the local resources and facilities of local public health agencies in the planning and conduct of its health program.
2. This study shows that in some high schools health is taught as part of several related subjects such as biology, general science and physical education, while in other schools health is a separate and distinct subject of instruction. There is definite need for a controlled study which will demonstrate the effectiveness of these two methods of health instruction at the high school level.

3. Very few high schools submitted outlines of their courses of health instruction as requested in the questionnaire. Further check-up with many of the schools indicates that there is a need for the development of a definite course of study for health instruction in the senior high school, based upon the actual health needs and interests of high school boys and girls.
4. There is need for setting up definite professional requirements for those who teach health in the secondary schools. The topics included in a high school course in health demand a professional training in education and in health.
5. High school teachers need to become more conscious of the health problems of their pupils. They need to know about the existing physical defects of their pupils. They need to make wider use of the school health record cards. They need to consider individual pupil health problems as they relate to the total efficiency of the pupil. Health guidance needs to be related to the program of educational guidance in the high school.
6. This study demonstrates that some high schools are requiring health certificates of high school teachers, and that a chest X-ray is part of the requirements for the health certificate. Such a procedure promotes the health and efficiency of the teaching force and protects the pupils in the schools. This procedure needs wider adoption.
7. This study shows that many high schools, especially in smaller towns, are without physical education programs, and that other schools have a program which provides only for one or two of the high school years. There is need for an expansion of the physical education program.
8. High schools with an athletic program need to give more attention to the health status of those who participate in athletics. Every candidate for athletics should be given a thorough health examination at the beginning of each sports season—fall, winter and spring. Not all schools follow this desirable procedure.
9. This study reveals that many high schools give each pupil an annual health examination, allowing an average of 5 to 6 minutes per examination. There is need for an analysis of the adequacy of this type of examination and the follow-up procedures used in obtaining the correction

of physical defects.

10. There is need for the development of a plan for the most effective use of the time which the school physician and the school nurse devote to the high school.
11. The school cafeteria needs to become more of an integral part of the health education program of the school.
12. The transportation problem in some schools needs constant checking so that the time required for a single day's travel to and from school can be reduced to a minimum.

* * * * *

Health Instruction,—The Board of Regents of the University of the State of New York, the body that has legal control of the programs and activities of the schools of that state, has revised the rules regarding interscholastic athletic competition, improved the regulations regarding the health service procedures, and improved rules concerning health training and instruction.

"The former regulations of the Commissioner of Education with respect to health instruction are repealed and a new section entailing more specific provisions substituted therefor. Throughout the program of instruction special attention will be devoted to nutrition, including adequate diets and eating habits. Hereafter the secondary school curriculum will include health instruction as a constant for all pupils. All senior schools must include an approved course in health teaching. One unit of Regent's credit will be given for this course. The courses will be taught by teachers with approved preparation for this work." This is the first time that health education in the secondary schools of the state has been a state-wide requirement. Bulletin to the Schools, Oct. 1942, page 42. The University of the State of New York.

* * * * *

School Sanitation,—One of the first steps in maintaining a clean and wholesome building is to remove all causes of insanitation. Soap and water plus elbow grease will remove most pungent odors and disfigurement from the walls and floors. Proper cleaning agents have their place, but there is no one cure-all. All rubbish and trash should be removed from the building and destroyed. Dark corners and accumulated dirt should be cleaned up. Rubbish and dirt breed insects and are also a source of fire hazards. Not only is this true of the basement and unexcavated portion of the building but also of the attic. Bulletin to the Schools, Oct. 1942, page 75.

SIGNIFICANT FINDINGS OF THE MASSACHUSETTS HIGH SCHOOL STUDY AND THEIR IMPLICATIONS FOR HEALTH EDUCATION PROGRAMS*

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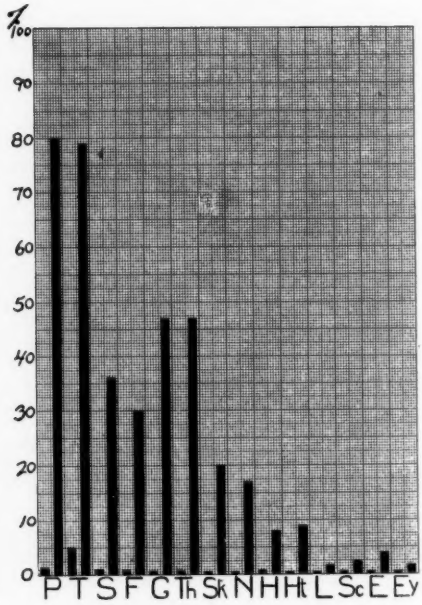
Miss Latimer has reported (in this issue of the Journal) on the health education activities of Massachusetts high schools and Mr. Southworth has reported (December issue of the Journal) the procedures in the detailed study of twenty-seven selected high schools. This paper summarizes the findings of the study with respect to physical status and with respect to the testing of health practices, interests, knowledge and attitudes among high school students.

Through the cooperation of school health services, we set out to learn what physical defects were present among high school students and to what extent each defect existed. Our study revealed the fact that it is impossible to determine the health status of high school students in Massachusetts from the medical data recorded in the schools. The variation in the percentages of defective pupils found in different schools is greater than could conceivably take place if the same standards of defectiveness were used throughout the State.

The following figures give the minimum and maximum percentages of certain defects found in separate schools. The pupil populations from which these figures were taken was fifty in the smallest school, and varied from that figure to six hundred in some of the larger schools. The comparative percentages of pupils showing each defect, as shown in the accompanying graph, are: postural defects 1.1 to 80.0, tooth defects from 5 to 79, defects of vision from .9 to 36, defects of feet from .8 to 30, glandular defects from .6 to 47, throat defects from .6 to 47, skin defects from .5 to 20, nasal defects from .3 to 17, defective hearing from .6 to .8, heart defects from .3 to 9, defects of the lungs from .3 to 1.6, defects of the scalp from .5 to 2.3, diseases of the ear from .5 to 4, diseases of the eye .5 to 1.7.

It is not only clear that the figures from individual towns are meaningless; it is also true that average figures showing defectiveness in the State are meaningless. It is impossible to provide the people of our towns and cities or the people of our State with meaningful figures of the physical defectiveness of high school

*American School Health Assn. Meeting, St. Louis, Oct. 30, 1942.



Minimum and maximum percentages of pupils showing certain physical defects within 22 Massachusetts high schools. The defects, from left to right relate to Posture, Teeth, Sight, Feet, Glands, Throat, Skin, Nose, Hearing, Heart, Lungs, Scalp and Eye diseases.

pupils. We must expect variability of individual judgment but we must, as public health administrators, recognize the responsibility of making school medical examinations more nearly comparable than they are at present. There is no evidence to suggest that the condition found in Massachusetts is different from the condition in other states of the Union.

To what extent are defects being corrected at the high school level? Comparisons of the incidence of physical defects give no indication of a reduction of defectiveness in the succeeding years of the high school. These figures are comparable since the different classes in the same schools are examined by the same medical adviser. It would appear that although some defects may be corrected, corrections are not being made more rapidly than new defects appear.

One function of the health examination is to give pupils an awareness of their health status. We were interested to determine

the degree to which pupils are informed on these matters. We asked pupils to record for us on a check list, without using their names, which defects they had. By means of a key numbering system we then compared the defectiveness as recorded on his health card with the pupil's awareness of his defects.

Checking the pupil's report against the defects recorded on his card, we found that pupils were aware of about half (54%) of the defects recorded. They also told us which defects had been or were being corrected. The defects under correction amounted to 60% of those known to the pupils or 30% of those recorded on the health cards. Data for individual items are to be seen in Table I.

TABLE I
HIGH SCHOOL PUPILS AWARENESS OF PHYSICAL DEFECTS RECORDED ON THEIR RECORD CARDS, AND THE NUMBER OF DEFECTS RECEIVING ATTENTION

Grades 10, 11 and 12 — Boys and Girls					
Areas of Defects	Number of Pupils	Recorded Defects	Per Cent with Defects	Pupils Aware	Attention to Defects
Teeth	1579	312	20 %	268	161
Posture	1212	92	8 %	20	5
Sight	1632	209	13 %	143	110
Feet	1082	15	1.4%	5	4
Glands	1017	36	4 %	7	0
Throat	1565	113	7 %	39	15
Skin	1140	57	5 %	17	11
Nose	1010	62	6 %	10	5
Hearing	1217	65	5 %	30	15
Heart	1372	35	3 %	6	4
Lungs	465	4	0.9%	1	0
Scalp	44	1	2 %	0	0
Ear (diseases)	1036	15	1.4%	2	0
Eye (diseases)	367	4	1.1%	0	0
Totals		1020		548	330

That pupils need more information concerning the results of the examination is shown by the fact that only half of their defects are known to them. We have also an indication of pupil desire for more information in regard to defectiveness. When we asked pupils to write down questions in health which they would like to have answered, a large number of the questions submitted were those concerning personal health status, which could be best answered by the physician.

In the third part of the study, which Mr. Southworth* has

*Journal of School Health, December, 1942, p. 311.

described to you, we gave objective tests in the field of health habits, health knowledge and health attitudes, and we secured data concerning the intelligence quotient of pupils as recorded by the school. We were interested in studying these tests for differences at the different high school grade levels, and for differences between different kinds of communities. We were also interested in studying the relationships between these different kinds of tests in terms of correlations.

In so far as our test was an accurate reflection of health practices, it would appear that the quality of health practices remains constant throughout the high school period with no improvement from grade to grade. No difference is reflected in the quality of health habits of high school students in different types of communities (industrial, rural, or residential). Girls have a consistently better rating than boys. The average score for boys in all grades and in all communities was in the neighborhood of 53 and the average score for girls in all grades and in all communities was in the neighborhood of 60. The detailed data and the range of grades are given in Table II.

The averages for boys and girls in the health knowledge quiz are alike; and again there are no differences in different types of communities. There is a slight improvement from grade to grade, the average score in grade ten being approximately 70.7, that in grade eleven being 73.4, and in grade twelve 74.8.

In the attitude quizzes, again there is little difference between the scores in different types of communities. The average for boys in rural communities are consistently a point or so above those of any other type of community, but this is not necessarily a significant difference. The average scores in the attitude quizzes rise only slightly from grade to grade, being approximately 73.4 for grade ten, 74.2 for grade eleven, and 75.2 for grade twelve.

We have computed 83 correlations between the habit tests, the knowledge tests, the attitude tests, and the intelligence quotients, with pupil groups varying in size from 100 to 452. Thirty-six of these correlations for boys and for girls separately by grades for the industrial-rural communities are shown in Table III. Those for the other groups and types of communities are similar in range and magnitude.

Regarding as significant any coefficient of correlation which was greater than $\frac{2}{\sqrt{n-1}}$, the following results may be said to be reflected from the correlations.

TABLE II
RESULTS OF TESTING A SAMPLE OF 9000 MASSACHUSETTS HIGH SCHOOL BOYS AND GIRLS WITH THREE HEALTH QUIZZES

Test	Group	Grade 10						Grade 11						Grade 12					
		Boys			Girls			Boys			Girls			Boys			Girls		
		Number of Pupils	Average Grade	Range of Grades	Number of Pupils	Average Grade	Range of Grades	Number of Pupils	Average Grade	Range of Grades	Number of Pupils	Average Grade	Range of Grades	Number of Pupils	Average Grade	Range of Grades	Number of Pupils	Average Grade	Range of Grades
Health Habits	A	310	53.00	20-89	400	60.05	24-87	352	54.25	26-91	391	61.25	27-92	329	54.25	26-92	490	60.50	26-91
	B	159	53.08	23-87	162	60.05	32-90	128	53.30	26-87	181	60.50	28-89	116	54.15	17-94	170	59.35	29-90
	C	241	53.35	21-88	293	61.76	28-86	236	52.28	18-91	266	60.90	27-90	226	51.64	18-94	316	59.68	26-90
	AB	346	53.54	22-96	387	60.95	30-94	281	51.90	21-89	324	60.25	27-90	257	52.72	23-90	304	60.45	33-90
	AC	432	54.15	16-90	558	60.46	81-93	387	53.46	24-92	474	61.60	27-88	384	53.84	25-94	481	60.76	27-91
Health Knowledge	A	310	69.00	36-88	397	69.70	44-92	353	73.00	41-95	392	73.70	44-93	329	74.95	46-93	491	74.00	47-93
	B	163	71.45	44-93	165	70.60	41-92	130	73.00	45-93	183	72.85	49-91	116	76.95	58-92	170	75.65	50-92
	C	243	70.60	45-89	295	71.10	47-91	241	73.20	44-89	274	74.15	46-92	232	74.20	46-94	325	74.85	48-93
	AB	347	70.80	44-91	388	70.90	46-97	282	73.10	53-92	324	73.04	52.94	257	73.03	53-95	300	73.02	50-94
	AC	435	70.70	37-91	564	71.25	37-91	385	74.65	40-94	479	73.70	46-94	389	76.40	46-94	489	76.20	42-95
Health Attitudes	A	297	69.60	24-89	364	70.10	32-89	330	73.50	22-90	355	74.50	35-91	295	73.15	25-93	453	76.55	37.93
	B	143	73.10	37-90	157	74.10	46-89	120	75.25	52-88	165	75.95	51-92	101	76.15	55-90	153	76.60	50-92
	C	220	70.20	41-89	279	74.00	38-91	214	73.60	38.90	217	73.33	50-90	203	73.75	41-93	307	75.60	45-94
	AB	324	72.25	40-91	376	73.00	45-91	267	73.20	42-91	309	74.75	45-90	244	74.90	51-91	291	77.00	41-95
	AC	409	71.00	30-90	540	73.00	33-94	367	73.50	46-92	446	74.55	46-91	374	74.00	24-91	382	79.00	44-94

A = Industrial Communities
B = Rural Communities
C = Residential Communities
AB = Industrial-Rural Communities
AC = Industrial-Residential Communities

TABLE III
COEFFICIENTS OF CORRELATION FOR HIGH SCHOOL PUPILS IN INDUSTRIAL RURAL COMMUNITIES

Grade and Sex	$\frac{2}{\sqrt{n-1}}$	Habits with Knowledge	Knowledge with Attitudes	Knowledge with I. Q.	Habits with I. Q.	Habits with Attitudes	Attitudes with I. Q.
12 girls	(.1174)	.2291	.4028	.4316	.0717	.1869	.4241
12 boys	(.1250)	.0390	.2985	.2620	.0654	.2792	.1744
10 girls	(.1035)	.1347	.3913	.5225	.0411	.1378	.3285
10 boys	(.1191)	.0847	.2883	.4744	.–0591	.1910	.0691
11 girls	(.1151)	.0154	.2977	.4233	.0516	.1417	.2359
11 boys	(.1426)	.08013	.3703	.5893	.–1012	.1655	.2743

There is apparently no correlation between the scores of the health habit quiz and intelligence quotient, all of the coefficients being near zero and several of them being negative. There is no significant correlation between the scores of the health habit quiz and the scores of the health knowledge tests. Only one-third of the correlations are greater than $\frac{2}{\sqrt{n-2}}$, and they are only slightly greater.

It should be borne in mind that the health habit quiz is a report from the child on whether or not he does certain specific things and that the report is made anonymously. It may be regarded as a reasonable reflection of his health practices. If so, it is clear that the more intelligent children do not as a group have better health practices than the less intelligent. Nor is there a significant relationship between how much children know about health, as reflected by the health knowledge test, and their practices, although the statistician might contend that there is more of an indication of a possible relationship than in the case of the intelligence quotient.

Some of the health knowledge questions had nothing to do with health practices. If all of the questions had been that type, of course, no relationship would have been expected. But, in general, there seems little relationship between health knowledge and health habits as reflected in such tests. There is need for studies which will, with proper educational technic compare actual health practices with the knowledge of pupils in relation to these practices. We may get some data on this point by comparing the item analysis of the two tests.

The highest correlations are those between health knowledge and intelligence quotients. Here the coefficient of correlation is in the neighborhood of .49. These coefficients are interesting for

comparison with the correlations between general intelligence and objective tests in other subjects of instruction. It is as high as that for other high school subjects but lower than those for certain subjects taken earlier. In "The Student and His Knowledge", a report to the Carnegie Foundation on the results of high school and college examinations of 1928, 1930 and 1932, Learned and Wood report correlations between scores in intelligence tests and scores in achievement tests as follows: with English .59, civics .53, algebra .52, French .48, general science .47, American history .47, Physics .45, Latin .42, European history .42, plane geometry .42, biology .42, Chemistry .38, trigonometry .36. These studies used the Otis test. They were made in Pennsylvania.

In looking for correlations between the scores on the attitude quiz and those on habits, knowledge and general intelligence, we find the highest correlation between knowledge and attitudes where the correlations are mostly in the range of .3 to .4.

The correlations between attitudes and intelligence quotient are lower and more variable, although all but one out of 21 are significant. The significant coefficients of correlation lie between .17 and .42, the average being .22.

The coefficients between habit scores and attitude scores are still lower, being in the neighborhood of .18 and near the limit of reliability.

It would appear, therefore, that both health knowledge and general intelligence have a significant effect upon health attitudes as reflected in this test and that the relationships in both of these instances are stronger than the relationship between health habits and health attitudes. In other words, this attitude test seems to be influenced more by what pupils know than by what they do.

It should not be concluded from the absence of significant correlations between the habit test and the knowledge test that the teaching of health facts cannot affect behavior. Some phases of health knowledge in such areas as structure, function and sanitation do not affect personal habits, although they represent desirable information for any intelligent person. Moreover, we have long recognized that the imparting of information and the development of human behavior may be quite separate and distinct, in the fields of religion, civic integrity, the psychology of human relationships and other phases of behavior, as well as in health. The school and the home have responsibility for developing both sound behavior and intelligence with respect to health, and they should recognize that each can be developed separately to a considerable

degree, that they can both be better developed through the dual approach, but that neither health knowledge nor health habits should be expected to produce the other.

Studies are being made of the interests reported by pupils, who checked items that they would like to know more about, and who in addition made a list of questions of their own that they would like to have answered. The analysis of these data is not completed. Certain facts, however, are already apparent. For one thing many pupils want the kind of information which they could best secure from the school physician or the family physician. In the second place, it is interesting to note that many pupils said they desired information in the field of social hygiene, although no reference whatever was made to sex hygiene or the venereal diseases in any of the objective tests or in any other activity connected with this study. We shall eventually secure a quantitative statement of amount and areas of interest reflected by pupils.

Conclusions:

1. The present system of school health examination lacks an objective basis—there is little uniformity in Massachusetts High Schools in what shall be called a physical defect, and as to which physical defects shall be included in the high school health examination.

2. There is need for revamping the procedures used in the high school health examination and follow-up to meet the needs of high school pupils.

3. There is need for improving the health education aspects of the school health examination—pupils who have defects found by school health examination have not been adequately helped to understand the significance of such findings.

4. There is need for medical counseling or guidance in the high school.

5. The types of testing procedure used in this study were found by the high schools to be very stimulating. The schools and the pupils are anxious to know their scores. Pupils are interested in discussing the results of the tests and many of the items included in the tests. This suggests that the use of tests of this kind by high schools may well be recommended.

6. Further study would seem worthwhile to show the relationship between specific health practices and pupil knowledge of their desirability.

7. The already recognized separation between health knowl-

edge and health practices is clearly demonstrated in this study. This argues for a decision on one hand as to what our future citizens ought to know and on the other hand the need for a carefully planned program for training in healthful living.

8. It would appear that attitude tests of the type used here reflect the pupil's health knowledge to a greater extent than they indicate the pupil's health practices.

9. The health knowledge of pupils as reflected by the type of health knowledge test used here is as highly correlated with intelligence quotient as are achievement tests in the fields of biology, plane geometry, European History, Latin or Physics.

10. These tests reflect an absence of linear correlation between general intelligence and health practices among high school pupils.

* * * * *

Venereal Disease Control,—The Joint Committee of the American Pharmaceutical Association and the American Social Hygiene Association, organized to bring about closer cooperation between physicians and the pharmacists in eradicating syphilis and gonorrhea, has constantly urged druggists to follow, with reference to venereal diseases, the principles of ethical practice enumerated below:

1. The pharmacist should make no diagnosis.
2. The pharmacist should not prescribe for patients.
3. The pharmacist should refer patients to physicians.
4. The pharmacist should not sell "patent medicines" and thus encourage self medication of these infectious diseases.
5. The pharmacist should distribute literature of an informational nature regarding syphilis and gonorrhea. Such material may be obtained from health departments and from the American Social Hygiene Association.
6. The pharmacist should cooperate with the pharmaceutical society and official and voluntary health agencies in promoting high professional standards.
7. The pharmacist should stock and sell only reliable products for chemical and mechanical prophylaxis of venereal diseases, and provide reliable information regarding the value and limitations of accepted prophylactics used under approved conditions. American Social Hygiene Association Release.

EFFECT OF RATIONING ON NUTRITION IN GREAT BRITAIN DURING THE WAR*

WILLIAM M. FRAZER, M.D.

Chief Medical and Health Officer, City and Port of Liverpool, and Professor of Hygiene, University of Liverpool.

What Were Dietetic Habits in Great Britain Before the War?, —Dietetic habits varied enormously in accordance with the income level. As far as the lowest grades of income are concerned, we have it on the authority of Sir John Orr, who is here at the Congress, that in Great Britain one-fourth of the population had such a low income that they were unable to purchase the necessary *qualities* of food to keep their families in full health. Because of this, it could truly be said that the immediate cause of poverty in these income groups, with under-nutrition, was the possession of a family. That is the cause, in great part, *for family allowances.*

The dietary consisted of white bread, some potatoes, margarines, cheap jam, sometimes fried fish, tea, and skimmed milk. I need hardly spend time in commenting on a diet which was so deficient in vitamins, minerals, and animal proteins.

Not so much ignorance—that could be remedied—but plain inability to purchase anything better was the true cause. Less than four shillings per head per week on food was the average expenditure. You may ask, why, on this diet, there was not the degree of malnutrition—rickets, even scurvy—plain to everybody? The reason more malnutrition was not observed is that milk and meals were given in the schools, and vitamin preparations were fed to children under five. In other words, we obviated the worst consequences of the poor diet of the lowest income groups. The inability to provide proper food marked them, but left the fundamental element of under-nutrition only.

The most fertile cause of lack of attainment of full physical health—the realization of the full physical and possibly mental development of the child—is lack of a full amount of the growth producing foods. Stunted growth, immature development of the bony structure and of the muscle—perhaps of the brain (who knows!), in the children of the lowest income group, are some results of our failure to provide an adequate diet.

Higher Income Groups. As income increases, proportionate

*Read before the Joint Session of the Food and Nutrition Section of the American Public Health Association, and of the American School Health Association, St. Louis, October 29, 1942.

to the size of the family, so does the amount of animal protein, butter, milk, eggs, green vegetables, and fruits increase; until at an income of twelve shillings per head per week an entirely satisfactory diet can be obtained.

In very high income scales there is an excessive food intake and, as a result, a rise in diabetes, fatty degeneration of the heart, vascular degeneration, and the like. Overweight is here the problem—the reproachful glance of one's tailor, a visit to one of these convenient places where the comfortably off pay one hundred shillings a week to live off toast and orange juice and thereby reduce their weight. So we have the two ends of the scale:—the poor undernourished and the rich overfed.

But there was another factor.

Before the war Great Britain imported a great percentage of its food—all but 35% of its food. Today, it is producing over two-thirds of the food required under the rationing system, and not only that, but the production of the protective foods is largely increased.

Reformers have for years been preaching the doctrine that sound nutrition—the fundamental factor in public health—must go hand in hand with a revival of agriculture. But it has taken a war to bring about in Great Britain this essential union between agriculture and the nutritional side of Public Health. Rationing was done by the Minister of Food under Lord Woolton guided by the best scientific advisers, Professor Drummond and Lord Horder.

If the problem had been to ration strictly and to accept a heavy fall in the nutritional standards of the community as part of the country's war sacrifice, it would have been an easy one. But it had to be remembered that this is totalitarian war and that every ounce of energy had to be resorted to to win the war. An undeveloped nation could scarcely be expected to be a highly productive nation.

So the problem was; to ration strictly to save shipping space, and yet to provide food in such quantities and of such a quality that it could maintain fully the health and working capacity in the population for an indefinite but certainly long period, and which would, in addition, allow the growth of the child population to continue in full measure throughout the war.

These objects may seem to be quite incompatible, and they were certainly difficult of attainment. How was it done?

In the first place efforts were made toward a great increase in the home production of food. Millions of additional acres were

ploughed up, the yield of milk substantially increased, and the nation generally was encouraged to add its quota to food production by the extensive and intensive cultivation of garden and allotments. England has become a nation of gardeners and market gardeners at that. We no longer grow flowers, but potatoes, beans, peas, cabbages, lettuce, and the like.

This policy of sowing millions of additional acres by converting unused land or pasture to useable land seemed to require much more labor. This was obtained in two ways: land girls, school children, and university students at weekends and during vacations, plus the very intensive use of machinery. It is claimed that now Great Britain uses more machinery per acre of land cultivated than any other country in the world. Allotments and gardens produce protective foods of great value, and gardening is in any case a healthful—if to the unaccustomed, back-breaking—exercise. These foods, thus produced, are consumed in larger quantities by the poorer sections of the community than ever before.

Rationing in Great Britain. This is effected by the following means:

(a) Consumers are restricted to given—and small— amounts of fats, sugar, meat, bacon, cheese, jam, and tea. Some latitude is permitted by a system of points rationing,—for example, most tinned goods. The consumption of unrationed goods is left to the discretion of the purchaser. These were mainly bread, potatoes, vegetables, and oatmeal. Poultry and fish not rationed, but are difficult to get.

(b) The production and importation of luxury foods are reduced. The manufacture of cream is prohibited, as is the importation of fresh fruit and coffee—to save shipping—and concentrated orange juice for children is imported instead.

The use of supplies of wheat and other cereals for manufacture into highly refined foods was stopped or much restricted. Flour instead of being 73% extraction was raised to 85% of the wheat, i. e., from a food containing practically nothing but starch and protein to one containing in addition large amounts of the Vitamin B complex and of minerals, particularly iron. National wheatmeal bread contains, compared with white bread, three times as much of the Vitamin B complex, three times as much iron, more calcium and more protein (Vitamin B has been very deficient in the diet of the poorer class). Allowances of confectionary, pastry, and cakes are much reduced. People are now eating, in fact have no option but to eat, larger amounts than formerly of foods in a natural state and,

therefore, containing greater quantities of the protective nutrients, minerals, and vitamins.

(c) Milk and Vitamins Schemes and Food Priorities. The allowance here is:

2 pints of milk per day for children under 1 year.

1 pint per day for children of 1-5 and for expectant mothers.

2-3 pint per day for children of school age at school.

½ pint per day at home for all, in addition to school milk, delivered at home for the 5-18 year group.

Children up to 5 years get concentrated fish liver oil.

Children up to 3 years get also concentrated orange juice.

These arrangements take care of the nutrition of our young people.

(d) Price control is established on nearly every food in common use.

Subsidies on milk, bread, meat, and some other foods are given.

Thus the poorer classes are now better able to buy these valuable foods.

(e) Wages have been increased.

In general, therefore, it may be claimed that the really poor people, to whom I referred in the earlier part of this paper, have increased their consumption of the more valuable types of foods to the great advantage of their nutritional condition; while the rich, because of rationing, have perforce had to give up the excessive use of meats, fats, and sugar, and their health has benefited thereby. Professional and business men amongst my friends —many of them—have commented that under rationing they have lost weight, some one or two stones* and they all say that they do not feel any the worse for it.

The Minister of Health and local health authorities have been watching for evidences of malnutrition, but reports show that, in general, the state of nutrition, instead of having deteriorated, has actually in some areas improved, especially in children. Cases of scurvy, pellagra and other deficiency diseases have been reported, but so rarely as to be almost medical curiosities.

*Stone—14 pounds.

* * * * *

TUBERCULOSIS

H. F. KILANDER, Ph.D.*

Just what does John Q. Public know about tuberculosis? Does he believe that tuberculosis is inherited? Does he know how it is spread? How does he think it should be treated? To what extent are errors and superstitions about tuberculosis still surviving in America?

Answers to these questions would shed some light on the effectiveness of the educational efforts which are directed toward informing people about health matters.

Some evidence is presented here in regard to what the public knows about tuberculosis. The information has been obtained through two investigations undertaken for the purpose of determining what people believe about various health topics, including tuberculosis. Health information tests were used in both surveys, and the answers to the questions on tuberculosis are here analyzed together.

The writer has made a study on health information, using the Kilander Health Knowledge Test. This test consists of 100 multiple-choice questions covering the major fields of health education, such as nutrition, safety education, first aid, community hygiene, common errors and superstitions. Four of the questions deal with tuberculosis.

The test was given in 1936 to nearly 3,000 individuals, including high school and college students and adults, representing a variety of occupations. Teachers made up one-third of the adults tested. In addition, business men, firemen, stenographers, clerks and housewives, took the test. Since that year the test has been given annually to the same types of groups. The answers of 11,000 individuals have been analyzed up to the present time. Most of these people were from New Jersey. Scattered groups from several other states are also included.

Another survey was conducted by the U. S. Public Health Service, which developed seven health information tests used at the World's Fair in New York in 1939 and in San Francisco in 1940. Approximately 100,000 people were tested with an average of 15,000 per test. These tests included true-false and multiple-choice questions dealing with the important fields of health education. Fifteen of the questions were on tuberculosis. Data on these tests

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have been furnished the writer by the National Institute of Health of the U. S. Public Health Service.

The statistics for the two fairs were surprisingly similar and, consequently, the results have not been listed separately. Significant differences on two questions are described under geographical differences.

In considering the results of the surveys, two factors must be kept in mind—the Kilander test dealt with a large proportion of educated persons, and the USPHS tests were probably taken by persons better educated and informed than the average individual.

The average percentage of correct responses for the fifteen World's Fair questions was 56. This figure was lowest of the nine subject-matter categories into which all the questions were grouped.

The average proportion of correct answers for the four questions on tuberculosis in the Kilander test was 43. This score is also considerably below the average of 62 per cent obtained on the complete test of 100 questions.

These comparative figures indicate either that the public is less informed on tuberculosis than on other health topics or that the questions were more difficult. Since there was no deliberate choice of more difficult questions for tuberculosis, the former explanation is the more likely.

On a true-false question, 46 per cent stated that tuberculosis may be inherited. The Gallup Poll in 1939 obtained the figure of 53 per cent on the same type of question. Forty per cent of those answering the questions believed that tuberculosis is primarily an infection.

In 1936, about 45 per cent indicated that children acquired tuberculosis by getting the germs from drinking milk from infected cows, and 30 per cent on the same question considered contact with adults who have the disease as the most important source of infection. By 1941-42, the figures had become 25 and 50 per cent, respectively, indicating that the public was much better informed on these topics in the areas where the test was given.

Additional information concerning what the public believes about the communicability of tuberculosis is indicated by the following percentages. About 80 per cent believe that the room in which a tuberculosis patient has died should be closed and thoroughly fumigated to kill the germs. Fifteen per cent indicated that after the mattress and the bed used by a tuberculosis patient is left out in the sun for a day, it can be used with safety by any-

one else. About 90 per cent stated that an important contribution toward the reduction of tuberculosis has resulted from the tuberculin-testing of milk cows rather than beef cattle or sheep.

A comparison of the answers to the questions dealing with inheritance and communicability of tuberculosis indicates that the public is somewhat confused on these terms. This point is also substantiated by the figures from the Gallup Poll, where 76 per cent answered "yes" to the question "Do you think tuberculosis is communicable?" Fifty-two per cent of this same group also answered "yes" to the question "Do you think tuberculosis is inherited at birth?" These two figures add up to 128, indicating about 28 per cent over-lapping.

The relative importance in the opinion of the public of various procedures in the treatment of tuberculosis is shown by the following figures. About 90 per cent state that rest, rather than medicine or diet, is the most important single item in the treatment of tuberculosis. In 1936, 43 per cent stated that rest is most important in order to recover from tuberculosis, and another 50 per cent on the same question checked a dry climate as most important. A considerable improvement in information on this question is shown for 1941-42. At the World's Fair, 52 per cent indicated that a dry, warm climate is not essential for the cure of tuberculosis. That tuberculosis cannot be treated successfully with X-rays is understood by 60 per cent; the other 40 per cent are probably confusing treatment with diagnosis, since on another question 75 per cent state correctly that tuberculosis, rather than Bright's disease or cancer, cannot be diagnosed in the majority of cases in the early stages without X-ray. Some indication of the public's opinion on the relationship of nutrition to tuberculosis is seen in the question where 36 per cent reply that tuberculosis is primarily caused by faulty nutrition, rather than by infection. These individuals seem to have missed the essential point that germs are involved. In the treatment of tuberculosis seven per cent indicated diet as more important than either medicine or rest.

That a large number of people are misinformed or uninformed about tuberculin testing is evident from the following statistics. Only 46 per cent know that a positive reaction to a tuberculin test means that a person has been infected with tuberculosis. That the material used in the tuberculin test contains live germs is believed by 60 per cent. Very small numbers stated that tuberculin injection was a means of preventing or curing tuberculosis.

That general hygienic living, in addition to avoidance of contact with open cases, is very important in the prevention of tuberculosis is checked by 91 per cent.

Almost everyone associated "breathing dust from rocks, sand and metals" with tuberculosis, rather than with three other diseases.

That tuberculosis, rather than heart disease or cancer, has been materially reduced since 1920 is correctly checked by 70 per cent.

A comparison of the correct responses to the tuberculosis question by age-groups for the World's Fair questions shows the following ranking: first, 31-40 year group; second, 21-30 year group; third, 17-20 year group; fourth, 41 years and above.

In the Kilander survey it was found for the entire test that a general peak of average scores is apparently reached by the senior year in high school, except in instances where specific training is had during the senior year or following graduation. This generalization is arrived at from a comparison of the scores of high school and college groups with the scores of adults who completed high school, but did not continue their formal education. College students of approximately the same intelligence as high school seniors do not score higher unless they have had specific health instruction. A college education per se does not necessarily add to the health knowledge of students. The scores of the adults on the Kilander test would fall below those of the high school seniors and college freshmen if the scores of the teachers in the adult group were not included. These observations for the entire test also apply in general for the questions on tuberculosis.

On the basis of the World's Fair test statistics, occupational groups rank as follows in the number of correct responses to the questions on tuberculosis: first, professional health workers; second, professional group; third, housewives; fourth, owner-management group; fifth, students; sixth, clerks; seventh, skilled and semi-skilled group; eighth, laborers and domestics. No significant sex differences were noted in either the World's Fair or the Kilander survey. The ranking by occupations separately for each sex is exactly the same for the World's Fair questions, if the housewife group is not considered.

The scores on the World's Fair test question on tuberculosis for New York as compared with San Francisco are remarkably similar on 13 of the 15 questions, differing only an average of one or two per cent. The questions for which there were significant

differences are the following: In the West 94.5 per cent, as compared with 86.4 per cent in the East, associated tuberculin testing with milk cows rather than with beef cattle or sheep. The public in the East is better informed concerning the value of a dry climate in the treatment of tuberculosis, with 38 per cent considering this false as compared with 18 per cent in the West.

The findings obtained in the two surveys reported upon in this paper indicated that although Mr. John Q. Public is generally informed on the subject of tuberculosis, many individuals and groups are still misinformed on certain specific topics dealing with tuberculosis.

It is evident that extensive educational programs are needed if a larger portion of the population is to be enlightened sufficiently on this subject.

The schools and colleges have a definite responsibility to meet in this respect—that they can obtain good results is borne out by high scores obtained by classes where the subject of tuberculosis has been given at least average emphasis as compared with other health topics.

The public health agencies will need to continue their program of informing those groups which are now past school age.

The statistics discussed in this paper show, in part at least, where the emphasis is needed in the important job of educating the people of our country about tuberculosis. Bulletin of the National Tuberculosis Association, Vol. 28, No. 10, Oct. 1942, p. 149, 150, and 157.

* * * * *

Law Enforcement.—Under the various sections of Article XVII-A of the Public Health Law of the State of New York, the capable law enforcement official may obtain an injunction closing a house of prostitution without delay, seizing the furniture and equipment, and prohibiting the use of the structure for any purpose for a period of one year. Because such action results in money loss without hope of recompense, injunctions of closure and confiscation are regarded much more seriously than criminal procedures against the inmates. The most far-reaching effect is that these actions make it the business of every landlord to know of the uses to which his house is put. A corps of detectives is created among the most influential class of the city. It is easier to establish the fact that prostitution is practiced in a house than to prove that the inmates themselves are prostitutes. Health News, New York State Department of Health, Vol. 19, No. 48, November 30, 1942, p. 201.

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EDITORIALS

The two leading papers appearing in this Journal discuss the Massachusetts Study on the organization and effectiveness of the School Health Program in the High Schools.

Certain things shown by this study merit discussion. In only 9% of the schools reporting is the health service financed and operated by the local health department, in 70% by the school department, and in 11% by these departments operating jointly. In only 43% of these is the pupil who is absent three or more days for illness required to report on his return to the school physician or school nurse. In only a dozen of the large high schools is there full time nursing service. While in more than 90% of the high schools a notice of physical defect is sent to the parents, in less than one-half of these is the notice signed by the school physician.

These are indices of a condition which we suspect is not much different from conditions prevalent in the health service of secondary schools of the nation. The study shows an enormous variation between different schools in the percentage found of different physical defects when we compare one school with another. That only one-half of the pupils admit being aware of the defects that they have is also disturbing. Apparently the examinations and the reports on them are not objective. In other words, what constitutes a defect in each of the areas or senses examined is by no means standardized.

This condition or status of school health services is one of the important factors that make it so difficult to stir up enthusiasm, and thereby funds, for a more adequate school health service.

That school health conditions, as evidenced by the percentage of physical defects found, are not improving seems evident. Will the sudden increased interest in the health of adolescents that is being created by the war emergency stimulate a better health service? We hope so. C. H. K.

* * * * *

Hygeia for January 1943, carries an excellent article under the title, "What About Oleomargarine", written by Madeline Day, who has training and experience sufficient to make her opinion authoritative.

With farmers reported as selling their cows instead of milking them, with the increased demand for butter for the armed services and for "lend-lease", with a resultant condition of scarcity, either true or artifically created, that makes it impossible for the average householder—in this section of the country at least—to secure sufficient butter for the family, it behooves us to re-orient our ideas regarding butter substitutes.

We have held to the idea that oleomargarine was not an adequate or healthful substitute for butter because it lacked Vitamin A. This article states that 85% of the oleomargarine now on the market has been fortified with Vitamin A so that it carries adequate amounts. Moreover, if it is fortified for Vitamin A with fish liver oils, it also may carry significant amounts of Vitamin D —more than is in butter. Butter is practically devoid of Vitamin E, while oil from seeds is rich in it, and "properly prepared oleomargarine should carry appreciable amounts of this vitamin".

"In short, there is nothing at present to indicate that the use of fortified oleomargarine in place of butter would lead to nutritional difficulties. Butter may contain certain nutritional factors not yet fully identified. The public has a right to insist that butter and oleomargarine continue to be marked so that each is easily distinguishable. For the rest, it is a matter of taste and purse. Certainly oleomargarine can be purchased less expensively than can butter, and it takes a keener taste than most of us possess to distinguish between them by taste alone."

Here is a rich food, then, that has nutrional qualities at least equal to those of butter, that is less in price—and with prices skyrocketing upward this is an important factor—and that can be produced in unlimited amounts. Greatly increased use of it would tend to bring down to reason the present price of butter—in the local market about 70% higher than that of a year ago. It might be well to consider also—for the duration of the war at least—the abrogation of the heavy state taxes on oleomargarine. C. H. K.

ABSTRACTS

The Medical Curriculum,—There is much mental food in an editorial under this title in the August 15 issue of the *British Medical Journal.* One senses that medical educators in England have been as violently disrupted in their thinking as in their physical plants and activities, but that they are beginning to pull themselves together and to look into the dark corners now illuminated by the wartime searchlights. One also senses that great and inevitable changes in the training of physicians are close at hand. A system that has been dominated by scientific investigators and successful consultants is producing too few general practitioners; it must turn back and concern itself more intimately with the knowledge and bodily skills required by the practicing doctor. At the same time, it might acquire some of the methods of selection and training that have so markedly accelerated the acquisition of industrial skills during the war. The application of these changes should be integrated with a social and economic structure that will permit young men and women to marry freely at the age of twenty-three or twenty-four years; otherwise, the best stock may tend to be bred out of the race. Thus, the writer develops a rough outline of what the future British medical curriculum should provide for.

This startling revelation about medical education in Britain applies as well to the United States. Recent and present graduates are finding themselves in a world whose ideals and demands are proving very different from those of the schools in which they were trained. Often, the information they most urgently need was not emphasized in their undergraduate courses. The historical, and on that account obscure, fact that smallpox can be prevented by inoculation, for example, might these days become a primary piece of knowledge in an island garrison. The neglect of preventive opportunity of any sort will soon cease to be an omission; it will become an error of commission. Graduates in army practice will wonder why they were not taught this in medical school. The lungs with cavities, the livers with lumps and the various advanced degenerations of the retina may still provide teaching material, but they are not the stuff of which medical practice has been or will be made. They are the gross, the rare, the allegedly interesting, and contrast sharply with the trivial but common deviations that occupy most of the practitioner's time. As time goes on, the practitioner will want to know less about the museum and more about the conditions under which men should live, eat, sleep, work, love and play. How can they be taught to

appraise these things?

How indeed? Certainly not by changing the curriculum, although that may well accommodate itself to the interests and activities of those who are currently responsible for it. The world of today is moving into the hands of those who are active, dynamic, decisive—the "motor minds". These people have always eschewed the deliberative, scholarly and somewhat cautious impulses that have built the academic past. As they now come into power, they may well change the facets of the medical-school curriculum, and polish them too, but whether the product can thereby be changed is another matter.

The constitutional pattern of a person may be either in harmony with or antagonistic to the environment in which he is called to function, and his performance consequently may be good or poor. Or more happily, he may possess an adaptable constitution, which will allow him to function well under a variety of conditions; this has always been the constitution of the good general practitioner, and has proved to be his great value in war. Britain has repeatedly called for general practitioners, not for specialists. An improved selective process, or series of processes, by which such persons could be screened away from the brilliant performers in narrow fields would make the greatest contribution to our systems of premedical and preclinical schooling. If it could have been applied to the prewar student body, there would be less indication of postwar revision of the medical curriculum. New England Journal of Medicine, December 3, 1942, p. 887-88.

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